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EXAMINER	
LEUNG, CHRISTINA Y	
ART UNIT	PAPER NUMBER
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/715,269	KETTERIDGE, PETER A.	
	Examiner	Art Unit	
	Christina Y. Leung	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12-7-2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6-9, 11, 12, 15-18, 20, 23, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al. (US 6,907,195 B2).

Regarding claim 1, Yu et al. disclose a system for generating an optical signal (substitute signal architecture 10 shown in Figure 1(a) and in detail in Figure 1(b)), the system comprising:

a plurality of diodes (laser diodes 25), each diode having an input and an output;

a combiner 30 having a plurality of inputs and an output, the plurality of inputs coupled to the outputs of the plurality of diodes; and

a control circuit 20, coupled to the input of each of the plurality of diodes, the control circuit programmable to selectively switch on ones of the plurality of diodes to produce an optical output signal at the output of the combiner with selective control of temporal, spectral and amplitude aspects of the optical signal (column 2, lines 55-67; column 3, lines 1-40).

Regarding claim 6, Yu et al. disclose a system for generating an optical signal (Figure 1(b)), the system comprising:

a plurality of light emitting devices (lasers 25), each light emitting device having an input and an output;

a combiner 30 having a plurality of inputs and an output, the plurality of inputs coupled to the outputs of the plurality of light emitting devices and the output providing a composite signal; and

a control circuit 20, coupled to the plurality of light emitting devices, wherein the control circuit controls the plurality of light emitting devices to shape the composite signal in time, frequency, and amplitude (column 2, lines 55-67; column 3, lines 1-40).

Regarding claim 11, Yu et al. disclose a method for generating an optical signal (Figure 1(b)), the method comprising:

selecting at least one of amplitude, time and frequency characteristics for the optical signal;

generating a set of control signals to achieve the selected characteristics of the optical signal (using control circuit 20);

applying the control signals to a plurality of discrete light emitting devices (lasers 25) to produce a set of output optical signals with time, frequency and amplitude characteristics based on the selected characteristics for the optical signal (column 2, lines 55-67; column 3, lines 1-40);

selectively combining the output optical signals from the discrete light emitting devices to produce the optical signal (using combiner 30); and

outputting the optical signal.

Regarding claim 12, Yu et al. disclose an apparatus comprising an optical pulse shape generator (substitute signal architecture 10 shown in Figure 1(a) and in detail in Figure 1(b)), including:

a plurality of light emitting devices (lasers 25), each light emitting device having an input and an output;

a combiner 30 having a plurality of inputs and an output, the plurality of inputs coupled to the outputs of the plurality of light emitting devices and the output providing a composite signal; and

a control circuit 20, coupled to the plurality of light emitting devices, wherein the control circuit controls the plurality of light emitting devices to shape the composite signal in time, frequency, and amplitude (column 2, lines 55-67; column 3, lines 1-40);

an optical amplifier, coupled to the output of the optical pulse shape generator (amplifier 12 is coupled substitute signal architecture 10 as shown in Figure 1(a); and

a delivery system (cable 14), coupled to the output of the optical amplifier, for delivering the output to a selected target (column 2, lines 48-52).

Regarding claim 20, Yu et al. disclose a method for generating an optical signal (Figure 1(b)), the method comprising:

selecting at least one of temporal, spectral and amplitude aspects of the optical signal to be generated (column 2, lines 55-67; column 3, lines 1-40);

generating control signals for a plurality of light emitting devices (lasers 25) to achieve the selected aspects of the optical signal (using control circuit 20);

applying the control signals to the plurality of light emitting devices; and

optically combining the outputs of the plurality of light emitting devices to produce the optical signal (using combiner 30).

Regarding claim 24, Yu et al. disclose a system for generating an optical signal (Figure 1(b)), the system comprising:

a plurality of independent light sources (lasers 25);

means for generating control signals for the plurality of independent light sources to generate the optical signal with selected temporal, spectral and amplitude components (control circuit 20; column 2, lines 55-67; column 3, lines 1-40); and

means, coupled to the plurality of independent light sources, for optically combining the outputs of the plurality of independent light sources to produce the optical signal (combiner 30).

Regarding claim 2, Yu et al. disclose that each diode of the plurality of diodes emits light with a selected frequency (column 2, lines 55-67; column 3, lines 1-40).

Regarding claims 3, 8, and 17, Yu et al. disclose that each diode of the plurality of diodes is a laser diode designed for telecommunications (i.e., a "telecommunications diode"; column 3, lines 29-31)

Regarding claims 4, 9, and 18, Yu et al. disclose that the combiner 30 comprises a number of separate combiners coupled together to provide a plurality of inputs and one output (Figure 2; column 4, lines 57-62).

Regarding claims 7 and 16, Yu et al. disclose a user interface, coupled to the control circuit, the user interface for receiving signals for defining a desired shape for the composite signal (Yu et al. disclose a user interface such as a laptop computer; column 2, lines 63-67).

Regarding claim 15, Yu et al. disclose that the delivery system is an optical fiber (column 2, lines 48-52).

Regarding claim 23, Yu et al. disclose that applying the control signals to the plurality of light emitting devices comprises applying the control signals to a plurality of diodes (using control circuit 20; column 2, lines 55-67; column 3, lines 1-40).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5, 10, 13, 14, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. in view of Kish, Jr. et al. (US 7,079,715 B2).

Regarding claims 5, 10, 19, and 22, Yu et al. disclose a system and method as discussed above with regard to claims 1, 6, 12, and 20 respectively, including combining output signals using a combiner 30. Yu et al. do not explicitly disclose that the combiner may comprise a fiber star connector.

However, it is well understood in the optical systems art that various types of combiners may be used to combine light signals in a system such as disclosed by Yu et al., including star couplers. Kish, Jr. et al. in particular teach a system that is related to the one disclosed by Yu et al. including a combiner 16 combining outputs from a plurality of light emitting devices 12(1)-12(n) to produce a composite signal output (Figure 1). Kish, Jr., et al. further teach that the combiner may comprise one of a variety of types of optical combining devices include a star connector (column 7, lines 42-47).

Regarding claims 5, 10, 19, and 22, it would have been obvious to a person of ordinary skill in the art to use a star connector as taught by Kish, Jr., et al. in the system and method disclosed by Yu et al. as an engineering design choice of a way to implement the combiner already disclosed by Yu et al. using a well-known and widely available combining element. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art. Examiner further respectfully notes that Yu et al. already disclose that the combiner 30 in their system may be implemented with various elements (column 4, lines 45-52).

Regarding claim 13, Yu et al. disclose a system as discussed above with regard to claim 12, including an optical amplifier coupled to the output of the optical pulse shape generator, but they do not specifically disclose a particular type of optical amplifier.

However, many different types of optical amplifiers are known in the optical systems art. Again, Kish, Jr. et al. teach a system related to the one disclosed by Yu et al. including using combiner 16 to produce a composite signal output (Figures 1 and 2) and also in particular teach including an optical amplifier coupled to the output of combiner 16 system. Kish, Jr., et al. further teach that the optical amplifier may comprise a semiconductor laser amplifier (i.e., a solid state laser; column 20, lines 26-31).

Regarding claim 13, it would have been obvious to a person of ordinary skill in the art to include a solid state laser amplifier as taught by Kish, Jr. et al. in the system disclosed by Yu et al. as engineering design choice of a way to provide the optical amplification already disclosed by Yu et al. using a well-known type of optical amplifier. Again, the claimed differences exist

not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Regarding claim 14, Yu et al. disclose a system as discussed above with regard to claim 12, including an optical amplifier coupled to the output of the optical pulse shape generator. Yu et al. do not specifically disclose another optical amplifier (a pre-amplifier) coupled in series to the disclosed amplifier and the output of the optical pulse shape generator.

Again, Kish, Jr. et al. teach a system related to the one disclosed by Yu et al. including using combiner 16 to produce a composite signal output (Figures 1 and 2). Kish, Jr. et al. further teach the composite signal is amplified with a plurality of amplifiers coupled in series a from the output of the combiner 16, including amplifier 64 which is a pre-amplifier amplifying the composite signal before it travels further to amplifier 24 (Figure 2; column 20, lines 1-31).

Regarding claim 14, it would have been obvious to a person of ordinary skill in the art to include an additional optical amplifier (a pre-amplifier) as taught by Kish, Jr. et al. in the system disclosed by Yu et al. in order to ensure that the composite optical signal is output at a sufficient amplitude to be properly transmitted in the optical communications system. One in the art would have been particularly motivated to include a pre-amplifier as taught by Kish, Jr. et al. since Yu et al. already generally disclose that some pre-amplification means may be included in the combiner 30 in order to provide additional amplification to the output of the optical pulse shape generator (column 5, lines 13-16).

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al.

Regarding claim 21, Yu et al. disclose a method as discussed above with regard to claim 20, including selecting at least one of temporal, spectral and amplitude aspects of the optical

signal to be generated. They do not explicitly disclose producing an optical signal that decreases from an initial amplitude in steps to a final amplitude over discrete time intervals during the duration of the optical signal.

However, Yu et al. generally disclose selecting temporal, spectral and amplitude values to produce an optical signal that exhibits characteristics as desired during the duration of the optical signal. Furthermore, Yu et al. disclose controlling the power/amplitude of the optical signal (column 3, lines 7-12) and also disclose controlling the amplitude of the optical signal in steps over discrete time intervals when an individual laser among the plurality of lasers 25 is separately turned on or off as needed (column 5, lines 44-64). It would be well understood in the optical systems art that in the system disclosed by Yu et al., the optical signal output from combiner 30 would be controlled to decrease in steps when the system turns off several of lasers 25 over a period of time.

It would have been obvious to a person of ordinary skill in the art to specifically produce an optical signal that decreases from an initial amplitude in steps to a final amplitude over discrete time intervals during the duration of the optical signal in the method disclosed by Yu et al. in order to allow the system disclosed by Yu et al. to remove output beams from individual ones of lasers 25 as desired by users, such as when function is restored to each main transmitter that lasers 25 are designed to temporarily replace. Again, Examiner respectfully notes that turning off ones of lasers 25, and thereby causing a decrease in the amplitude of the composite signal output from combiner 30 in discrete steps, is already generally disclosed by Yu et al.

6. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. in view of Cohen (US 4,460,241 A).

Regarding claim 25, Yu et al. disclose a system for shaping an optical pulse (Figure 1(b), the system comprising:

a plurality of light sources (lasers 25), each light source having an input and an output and adapted to produce emit light at a selected frequency;

a combiner 30 having a plurality of inputs and an output, the plurality of inputs selectively coupled to respective ones of the outputs of the plurality of light sources;

a control circuit 20, coupled to the input of each of the plurality of light sources, the control circuit including a drive circuit that is programmable to selectively switch on ones of the plurality of light sources to produce an optical output signal at the output of the combiner with selective control of temporal, spectral and amplitude aspects of the optical signal (column 2, lines 55-67; column 3, lines 1-40); and

a user interface, coupled to the control circuit, the user interface for receiving signals for defining a desired shape for the optical signal (Yu et al. disclose a user interface such as a laptop computer; column 2, lines 63-67).

Further regarding claim 25, Yu et al. already disclose that light sources 25 are "light emitting" diodes in the sense that they disclose laser diodes that emit light, but they do not specifically disclose "light emitting diodes" in the conventional sense of the term in the art.

However, it is well understood in the optical systems art that various types of light sources may be used in a communications system such as disclosed by Yu et al., including lasers and light emitting diodes (LEDs). Cohen in particular teaches that in an optical communications system like the one disclosed by Yu et al, either lasers or light emitting diodes may be used as light sources for transmitting optical signals (column 1, lines 10-38).

It would have been obvious to a person of ordinary skill in the art to use light emitting diodes as taught by Cohen in the system disclosed by Yu et al. in order advantageously implement the light sources using elements that are less expensive and more reliable in comparison to lasers (Cohen, column 1, lines 33-38).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y. Leung
CHRISTINA LEUNG
PRIMARY EXAMINER